VIGNAN'S
FOUNDATION FOR SCIENCE, TECHNOLOGY & RESEARCH
(Deemed to be University) · Estd. u/s 3 of UGC Act 1956

**Department of Electrical and Electronics Engineering**

Date: 14.02.2026

# MINUTES OF BOARD OF STUDIES MEETING

Board of Studies (BoS) meeting of B.Tech., EEE program was conducted on 14.02.2026 in hybrid mode from 10.00 am to 11.00 am at VFF-07, H-Block, VFSTR.

**Agenda of the BoS Meeting:**

1. Review and approval of upgrading the credits for the course *PV Technologies and Applications*.
2. Approval of the new M.Tech. program in *Autonomous Electric Vehicles*.
3. Approval of NPTEL courses for EEE students.

The following members were present

| Sl. No | Name of the Member | Designation and Address | Role |
|---|---|---|---|
| 1 | Dr. K. Mercy Rosalina | Professor | Chairperson |
| 2 | Dr. Jithendranath J. | Senior Project Engineer, Hitachi Energy Technology Services P. Ltd., Grid and Power Quality Solutions, Chennai<br>Mobile: +91-9949537586<br>Email: jithendranath.j@hitachienergy.com | External Member (Industry) |
| 3 | Dr. B. Satish Babu | Sr. Staff Engineer, Infineon Technologies, Bangalore<br>Phone: 9958006750<br>Email: satishbabu.bhogineni@infineon.com | Invited Member (External) |
| 4 | Dr. Polamraju V. S. Sobhan | Associate Professor & HoD | Internal Member |
| 5 | Dr. M. Subba Rao | Associate Professor | Internal Member |
| 6 | Dr. N. Bharath Kumar | Assistant Professor | Internal Member |
| 7 | Dr. A. R. Vijay Babu | Associate Professor | Internal Member |
| 8 | Mr. K. Ashok Kumar | Assistant Professor, VFSTR Deemed to be University, Off Campus | Internal Member |
| 9 | Dr. K. Chakravarthi | Assistant Professor (BoA), Department of EEE, VFSTR | Member Secretary |

At the beginning of the meeting, the Chairperson of the BoS, Dr. K. Mercy Rosalina, Professor, Department of EEE, welcomed all the members and briefed them on the progress and activities of the department.

The following suggestions were given by the external members:

**Dr. Jithendranath J.**

- Suggested enriching the course *PV Technologies and Applications* by incorporating PV system design and latest application-oriented topics to meet current industrial demands, and recommended increasing the course credits from 3 to 4 considering the enhanced design-oriented and application-based content.
- Appreciated the introduction of the M.Tech. program in *Autonomous Electric Vehicles* as a future-oriented and industry-relevant program aligned with emerging trends in electric mobility, automation, and sustainable transportation technologies.
- Appreciated the introduction of new NPTEL courses for EEE students.

**Dr. B. Satish Babu**

- Appreciated the inclusion of advanced concepts in the course PV Technologies and Applications.
- Suggested including advanced and multidisciplinary topics such as autonomous driving technologies, battery management systems, embedded systems, IoT, Artificial Intelligence, Machine Learning, sensor fusion, and V2X communication in the curriculum.
- Suggested introducing Industrial Automation and Control as an NPTEL course.

**The following resolutions were made after detailed discussion:**

- The members approved the increase in credits for the course PV Technologies and Applications from 3 credits to 4 credits considering the enhanced design-oriented content, case studies, and application-based learning components.
- Approved the introduction of the M.Tech. program in *Autonomous Electric Vehicles* considering the rapid growth and future demand in EV and intelligent mobility sectors.
- The members approved the inclusion of NPTEL courses in emerging areas such as entrepreneurship, integrated circuits, smart grid technologies, and industrial automation in the curriculum.

1. Artificial Intelligence: Knowledge Representation and Reasoning (12 Weeks)
2. Entrepreneurship Essentials (12 Weeks)
3. Advertising & Promotions Management (12 Weeks)
4. Time Series Modelling and Forecasting with Applications in R (12 Weeks)
5. Embedded Sensing, Actuation and Interfacing Systems (12 Weeks)
6. Industrial Automation and Control (12 Weeks)
7. Semiconductor device modeling and Simulation (12 Weeks)
8. Smart Grid: Basics to Advanced Technologies (12 Weeks)
9. Ethics in Engineering Practice (8 Weeks)
10. Integrated Circuits, MOSFETS, OP-Amps and their Applications (12 Weeks)

Finally, the Chairperson thanked all the external and internal members for their valuable suggestions and active participation in the meeting.

**Member Secretary** **Chairperson**

The following are the members present for the board of studies meeting held at Department of Electrical and Electronics Engineering on 14.02.2026

| Sl. | Name of the Member | Designation and Address | Signature |
|---|---|---|---|
| 1 | Dr. K. Mercy Rosalina | Professor | |
| 2 | Dr. Jithendranath J. | Senior Project Engineer, Hitachi Energy Technology Services P. Ltd., Grid and Power Quality Solutions, Chennai<br>Mobile: +91-9949537586<br>Email: jithendranath.j@hitachienergy.com | |
| 3 | Dr. B. Satish Babu | Sr. Staff Engineer, Infineon Technologies, Bangalore<br>Phone: 9958006750<br>Email: satishbabu.bhogineni@infineon.com | Participated the Meeting Virtually |
| 4 | Dr. Polamraju V. S. Sobhan | Associate Professor, HoD | |
| 5 | Dr. M. Subba Rao | Associate Professor | |
| 6 | Dr. N. Bharath Kumar | Assistant Professor | |
| 7 | Dr. A. R. Vijay Babu | Associate Professor | |
| 8 | Mr. K. Ashok Kumar | Assistant Professor, VFSTR Deemed to be University, Off Campus | Participated the Meeting Virtually |
| 9 | Dr. K. Chakravarthi | Assistant Professor (BoA), Department of EEE, VFSTR | |

# PHOTOS


**Chairman, BoS**

# B.Tech-EEE
# Modified syllabus

## PV TECHNOLOGIES AND APPLICATIONS

| L | T | P | SL | C |
|---|---|---|---|---|
| 3 | 2 | - | 3 | 4 |

**PREREQUISITE KNOWLEDGE:**
Basics Physics, Basics of Electrical & Electronics Engineering

**COURSE DESCRIPTION AND OBJECTIVES:**
This course is aimed at familiarizing the students with the fundamentals, characteristics, parameters and manufacturing of solar PV cells, series and parallel connection of solar cells, I-V characteristics of a PV module. In these subject students will learn the sun tracking mechanisms, emerging solar cell technologies and battery energy storage systems. The course is also aimed at familiarizing the students with the design of PV system applications.

### MODULE–I

**18L+12T+0P+18SL = 48 hours**

**UNIT-I: SOLAR CELLS AND PV MODULES**

Photovoltaic effect, Types of solar cells - Monocrystalline, polycrystalline and amorphous silicon cells, Single diode model of solar cell, current equation, I-V characteristics of a PV cell, Parameters of a solar cell, series and shunt resistances, cell efficiency, cell & module efficiencies, fill factor, Series and parallel connection of solar cells, effect of irradiation and temperature, shading and hot spots.

**UNIT-II:**
**CLASSIFICATION AND COMPONENTS OF PV SYSTEMS**
Classification of PV systems, small system for consumer applications, Hybrid solar PV system, PV system components – charge controller, solar inverter, net metering system.

**PRACTICES:**

- Demonstrate the I-V and P-V characteristics of PV module with varying radiation and temperature level
- Demonstrate the I-V and P-V characteristics of series and parallel combination of PV modules.
- Demonstrate the effect of shading on module output power.
- Demonstrate the working of diode as bypass diode and blocking diode in a PV module.
- Obtain the charging and discharging characteristics of a battery.

## MODULE–II

**27L+18T+0P+27SL =72 hours**

**UNIT- I:**

**BATTERY ENERGY STORAGE**

Fundamental concept of batteries - Measuring of battery performance, Charging and discharging of a battery, Storage density, Energy density and safety issues; Types of batteries – Lead Acid, Nickel, Cadmium and Lithium-ion batteries, Choosing a battery for an application.

**UNIT- II:**

**MAXIMUM POWER POINT TRACKING**

Sun tracking – single and dual axis tracking, concept of MPPT technique, MPPT algorithms: Fixed voltage, FOCV, pilot cell, FSCC, P&O and Incremental Conductance. **Aryabhata and Brahmagupta's studies on sun tracking methods.**

**UNIT- III:**

**DESIGN OF PV SYSTEMS, APPLICATIONS AND EMERGING TECHNOLOGIES**

**Design of PV Systems**: Design of solar PV lantern and fan, residential PV system, solar powered EV charging station, solar water pumping systems.

**Applications**: Building Integrated Photovoltaics (BIPV), Transparent Solar Panels, Solar Roads, Floating Solar Power Plants, Space solar power satellites.

**Emerging Technologies:** Organic solar cells, Dye-synthesized solar cells, GaAs solar cells, Thermo Photovoltaics, Concentrated Photovoltaics

**PRACTICES:**

- Workout power flow calculations of standalone PV system of DC load with and without battery.
- Workout power flow calculations of standalone PV system of AC load with and without battery.
- Workout power flow calculations of standalone PV system of DC and AC load with and without battery.
- Review the different emerging solar cell technologies.
- Review the various applications of PV system.

**COURSE OUTCOMES:**

Upon successful completion of this course, students will have to ability to:

| CO No. | Course Outcomes | Blooms Level | Module No. | Mapping with POs |
|---|---|---|---|---|
| 1 | Analyze the I-V characteristics of PV cells and modules | Analyze | 1 | 1,2,3,4,5,6, 8,9 |
| 2 | Analyze the effect of various parameters on the performance of a solar module | Analyze | 1,2 | 1,2,3,4,5,6, 8,9 |
| 3 | Classify the Solar PV systems based on requirements | Analyze | 1,2 | 1,2,4,6, 8,9 |
| 4 | Choose a battery for a particular application | Analyze | 2 | 1,2,3,4,5,6, 8,9,11 |
| 5 | Design the various applications of PV system. | Evaluate | 2 | 1,2,4,5,6, 8,9,11 |

**Mapping of SDGs and IKS**

| Sustainable Development Goals (SDGs) | Indian Knowledge System |
|---|---|
| SDG 7 (Affordable and Clean Energy) | YES |
| SDG 9 (Industry, Innovation, and Infrastructure) | |
| SDG 11 (Sustainable Cities and Communities) | |
| SDG 12 (Responsible Consumption and Production) | |
| SDG 13 (Climate Action) | |

**TEXT BOOKS:**

1. Chetan Singh Solanki., Solar Photovoltaic: "Fundamentals, Technologies and Application", PHI Learning Pvt., Ltd., 2009.

**REFERENCES:**

1. Chetan Singh Solanki., "Solar Photovoltaic Technology and Systems: A Manual for Technicians" PHI Learning Pvt., Ltd., 2013.
2. Sukhatme .S.P, Nayak .J.K, "Solar Energy", Tata McGraw Hill Education Private Limited, New Delhi, 2010.
3. John R. Balfour, Michael L. Shaw, Sharlave Jarosek., "Introduction to Photovoltaics", Jones & Bartlett Publishers, Burlington, 2011.
4. Jha .A.R, "Solar Cell Technology and Applications", CRC Press, 2010.

**SKILLS:**

- Distinguish between series and parallel combination of PV modules.
- Analyze the effect of shading on module output power.
- Choose a battery for a particular application.
- Justify the need of various solar cell technologies.

**Chairman, BoS**